



สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Manual of Standards Airspace Management

CAAT-ANS-MOSASM

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Approved By

Chula Sukmanop, PhD

Director General

The Civil Aviation Authority of Thailand

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Foreword

The Director General of the Civil Aviation Authority of Thailand (CAAT) is responsible under Section 15/17 (2) of the Air Navigation Act B.E.2497 amended by the Air Navigation Act (No. 14) B.E. for issuing CAAT regulation on Air Navigation Services for Air Traffic Management: Airspace Management Standards to stipulate qualifications, rules, procedures, conditions, standards and practical guidance for the following matters to ensure conformity with current and timely International Standards.

The Manual of Standards (hereinafter ‘MOS’) is the means CAAT uses to meet its responsibilities under Section 15/17 (2) of the Air Navigation Act B.E.2497 amended by the Air Navigation Act (No. 14) B.E. 2562, CAAT regulation No.xx on Air Navigation Services for Air Traffic Management: Airspace Management Standards and CAAT rule on Manual of Standards - Air Traffic Management: Airspace Management for promulgating standards for Airspace Management. The MOS prescribes the detailed technical material (aviation safety standards) that is determined to be necessary for the safety of air navigation.

The MOS is referenced in the particular regulation. You should refer to the applicable provisions of the Air Navigation Act B.E.2497 amended by the Air Navigation Act (No. 14) B.E. 2562 and CAAT Regulation, Requirement and Rules together with this MOS, to ascertain the requirements of, and the obligations imposed by or under the civil aviation legislation.

Readers should forward advice of errors, inconsistencies or suggestions for improvement to this manual to the Manager, Air Navigation Services Standards Department (please see in subsection 1.1.6.3).

The MOS is issued and amended under the authority of the Director General of Civil Aviation Authority of Thailand.

Chula Sukmanop, PhD
Director General
The Civil Aviation Authority of Thailand

Record of Revision

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Chapter 1 Introduction

1.1 General

1.1.1 Background

1.1.1.1 Airspace Management provides the ASM functions and Air Traffic Management related procedures that are required to apply and fully exploit the Flexible Use of Airspace Concept (FUA). The objective of ASM is to achieve the most efficient use of the airspace based on actual needs and, where possible, to avoid permanent airspace segregation.

1.1.1.2 This MOS is made under the Air Navigation Act B.E.2497 amended by the Air Navigation Act (No. 14) B.E. 2562. CAAT Regulation, Requirement and Rules refer to the standards and methods to be used in regulating:

- a) the standards for compliance, include:
 - 1) the operations manual;
 - 2) the provider's organisation, facilities and equipment, personnel, and check and training system, formal arrangements, management system and records;
- b) what is required to accompany an application for an Airspace Management Provider's (hereinafter 'ASM Provider') certificate.

1.1.2 Document set

1.1.2.1 The document hierarchy consists of:

- a) The Air Navigation Act B.E.2497 amended by the Air Navigation Act (No. 14) B.E. 2562 (the Act) and the Civil Aviation Emergency Decree B.E.2558 (the Decree)¹;
- b) Civil Aviation Authority of Thailand Regulation and Requirement (the CAAT regulation and requirement)²;
- c) Manual of Standards (MOS); and
- d) Advisory Circulars (ACs).

1.1.2.2 The Decree establishes the Civil Aviation Authority of Thailand (CAAT) with functions relating to civil aviation, in particular the safety of civil aviation, and related purposes.

1.1.2.3 The CAAT regulation and requirement establish the regulatory framework (Regulations) within which all service providers shall operate.

1.1.2.4 The MOS comprises specifications (Standards) prescribed by CAAT, of the detailed technical provisions that contains standards, procedures, instruction which are intended to form the basis of ASM services within Bangkok FIR. The ASM provider in Thailand is required to comply with the provisions contained in this MOS. The ASM provider shall document local procedures in their own operations manuals, to ensure the maintenance of and compliance with standards.

1.1.2.5 Readers should understand that in the circumstance of any perceived disparity of meaning between MOS and the CAAT regulations/requirements, the primacy of intent rests with the regulations/requirements. Where there is any inconsistency between the regulations/requirements and the MOS, regulations/requirements prevail.

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- พระราชบัญญัติการเดินอากาศ พ.ศ. 2497 แก้ไขเพิ่มเติมโดย พระราชบัญญัติการเดินอากาศ (ฉบับที่ 14) พ.ศ.2562
- พระราชกำหนดการบินพลเรือนแห่งประเทศไทย พ.ศ.2558

2

- ข้อกำหนดของสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ 25 ว่าด้วยการขอและออกใบรับรองบริการการเดินอากาศ
- ข้อบังคับของสำนักงานการบินพลเรือนแห่งประเทศไทย ฉบับที่ xx ว่าด้วยมาตรฐานการบริการการเดินอากาศ เรื่อง การจัดการจราจรทางอากาศ ประเภทการจัดการห้วงอากาศ
- ประกาศสำนักงานการบินพลเรือนแห่งประเทศไทย เรื่องกำหนดประเภทนิติบุคคล อายุใบรับรอง และหน้าที่อื่นของผู้ได้รับใบรับรองบริการการเดินอากาศ
- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยการจัดทำรายงานของผู้ได้รับใบรับรองบริการการเดินอากาศ
- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยคู่มือมาตรฐานการให้บริการจัดการจราจรทางอากาศ ประเภทการจัดการห้วงอากาศ
- ระเบียบสำนักงานการบินพลเรือนแห่งประเทศไทย ว่าด้วยคู่มือการดำเนินงานด้านการจัดการจราจรทางอากาศ ประเภทการจัดการห้วงอากาศ

- 1.1.2.6 An ASM provider shall ensure that its airspace management service be provided in accordance with:
- a) the standards set out in the Manual of Standards (MOS); and
 - b) the standards set out or referred to in ICAO Cir 330
 - c) others document related to Airspace Management
- 1.1.2.7 ACs are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means of complying with the regulation and requirement. ACs may explain certain regulatory requirements by providing interpretive and explanatory materials. It is expected that service providers will document internal actions in their own operational manuals, to put into effect those, or similarly adequate, practices.
- 1.1.2.8 Where the ASM provider is unable to comply with any provision in any of this MOS, the ASM provider shall inform the CAAT within a reasonable period of time and in writing. The ASM provider shall explain the basis for its non-compliance and propose alternative steps to ensure that an equivalent level of safety is established. The CAAT will review the ASM provider’s proposal in a timely fashion and approve the proposal, subject to such other conditions it may impose. The ASM provider is required to follow-up diligently and thereafter report to CAAT within a reasonable period.
- 1.1.2.9 Where the CAAT has approved the ASM provider’s proposal in subsection 1.1.2.8, the ASM provider shall record the approved alternative steps to be taken in the ASM provider’s operations manuals. The operations manuals shall also contain the details of and rationale for the alternative steps, and any result limitations or conditions imposed.

1.1.3 Editorial Practices

- 1.1.3.1 To avoid any misunderstanding within the MOS, the words ‘shall’ as used within the requirements indicate the compliance is compulsory’ while ‘should’ means that it is strongly advisable that an instruction is carried out; it is recommended or discretionary.

1.1.4 Differences between ICAO Standards and those in MOS

- 1.1.4.1 Notwithstanding the above, where there is a difference between a standard prescribed in ICAO documents and the Manual of Standards (MOS), the MOS standard shall prevail.

1.1.5 Differences Published in AIP

1.1.5.1 Differences from ICAO Standards, Recommended Practices and Procedures are published in the AIP Thailand GEN 1.7 Differences from ICAO Standards, Recommended Practices and Procedures.

1.1.6 MOS Documentation Change Management

1.1.6.1 The Air Navigation Services Standards Department (ANS) has responsibility for the technical contents of this MOS.

1.1.6.2 This MOS is issued, and may only be amended, under the authority of the Director General of CAAT.

1.1.6.3 Suggested changes to this MOS may be provided to the Manager of Air Navigation Services Standards Department of CAAT by:

Email: ans@caat.or.th

1.1.6.4 Requests for any change to the content of this MOS may come from:

- a) technical areas within CAAT; or
- b) aviation industry service providers or operators; or
- c) individuals or authorization holders.

1.1.6.5 The need to change standards in this MOS may arise for any of the following reasons:

- a) to ensure safety;
- b) to ensure standardization;
- c) to respond to changed CAAT standards;
- d) to respond to ICAO prescription;
- e) to accommodate proposed initiatives or new technologies.

1.1.6.6 CAAT may approve trials of new procedures or technologies to develop appropriate standards.

1.1.7 Related document

1.1.7.1 These standards should be read in conjunction with:

- a) Civil Aviation Authority of Thailand Regulation and Requirement;
- b) ICAO Cir 330 - Civil/Military Cooperation in Air Traffic Management; and
- c) AIP-Thailand.

1.2 Definitions and Abbreviations

1.2.1 Definitions

For the purpose of this manual of standards, the definition as contained in the ICAO annex and ICAO document, as amended from time to time, shall apply unless as otherwise indicated in the AIP or as follow:

Definition	Meaning
Airspace Management provider	A provider responsible for ASM Level 2 (pre tactical) and ASM Level 3 (tactical level) management of the airspace under their responsibility.
Airspace management	The process by which airspace options are selected and applied to meet the needs of airspace users.
Airspace reservation	A defined volume of airspace temporarily reserved for exclusive or specific use by categories of users.
Airspace restriction	A defined volume of airspace within which, variously, activities dangerous to the flight of aircraft may be conducted at specified times (a ‘danger area’); or such airspace situated above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions (a ‘restricted area’); or airspace situated above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited (a ‘prohibited area’).
Airspace structure	A specific volume of airspace designed to ensure the safe and efficient operation of aircraft.
Airspace Use Plan	An ASM message of notifying the daily decision of the Airspace Management service provider on the temporary allocation of the airspace within its jurisdiction for a specific time period, by means of a standard message format.
Air traffic services unit	A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.
Approved Agency	An airspace users/operators who are authorised to submit to the Airspace Management Service Provider advance notifications on TSAs, TRAs, Restricted Areas and Danger Areas.
ASM Level 1 (Strategic Airspace Management)	A procedure regarding defining, monitoring, and reviewing, if necessary, change of national airspace management policy and airspace structures taking into account national and international airspace requirements.

Definition	Meaning
ASM Level 2 (Pre-Tactical Airspace Management)	A procedure regarding the operational airspace management within the framework of pre-determined existing ATM structures and procedures defined as ASM Level 1, and reaching specific agreements between civil and military authorities responsible for ASM Level 2
ASM Level 3 (Tactical Airspace Management)	A procedure regarding the operational airspace management in real time, on the day of flight operations in order to activate, de-activate or re-allocate the airspace allocated at ASM Level 2, and resolving specific problems and/or individual OAT/GAT situations in real-time between air traffic service units and control military units.
Civil-military coordination	The coordination between civil and military parties authorised to make decisions and agree a course of action to ensure the safe, efficient and harmonious use of the airspace;
Conditional Route	An ATS route or a portion thereof which can be planned for flying and used in accordance with certain specified conditions. A CDR may be established in one or more of the following categories: (1) Category 1 (one) – Permanently Plannable CDR; (2) Category 2 (two) – Non-Permanently Plannable CDR; (3) Category 3 (three) – Not Plannable CDR
Conditional route availability message	A special consolidated ASM message issued daily by the Airspace Management service provider on CDRs availability notified by the AUPs, and used by aircraft operators for flight planning purposes.
Controlling military unit	Any fixed or mobile military unit handling military air traffic and/or pursuing other activities which, owing to their specific nature, may require an airspace reservation or restriction.
Cross-border airspace	An airspace structure extending across national borders and/or the boundaries of flight information regions.
Cross-border area	A temporary reserved area established over international boundaries for specific operational requirements.
Danger Area	An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified time. The effect of the creation of danger area is to caution operators or pilots of aircraft that it is necessary for them to assess the dangers in relation to their responsibility for the safety of their aircraft, some danger areas subject to management

Definition	Meaning
	and allocation at ASM Level 2, are established at ASM Level 1 and identified as such in AIP.
Flexible Use of Airspace Concept	The fundamental principle that airspace should not be designated as either pure civil or military airspace, but rather be considered as one continuum in which all user requirements have to be accommodated to the extent possible.
Flight Information Region	An airspace of defined dimensions within which flight information service and alerting service are provided.
General Air Traffic	all civil aircraft flights, as well as all State aircraft flights, carried out in accordance with the ICAO procedures and CAAT regulations
Manageable Area	An area subject to management and allocation by an Airspace Management Provider at ASM Level 2
Notice to Airmen - NOTAM	A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aircraft device or infrastructure, service, procedure or hazard, the timely announcement of which is essential to personnel engaged with flight operations.
Operational Air Traffic	all civil aircrafts flights, as well as all State aircraft flights carried out in accordance with specifically defined procedures which depart from the rules and procedures for General Air Traffic (GAT).
Prohibited Area	An airspace of defined dimensions above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited. The flight of aircraft within the designated airspace is require prior authorization from appropriate agency.
Real-time	The actual time during which a process or an event occurs.
Restricted Area	An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions. The flight of aircraft within the designated airspace is not absolutely prohibited but require prior authorization from appropriate agency or pilot comply with specified entry criteria. Some restricted area subject to management and allocation at ASM Level 2, shall be established at ASM Level 1 and published as such in AIP.

Definition	Meaning
Temporary Reserved Area	A defined volume of airspace under the jurisdiction of a user authorised by the ASM Provider, which is temporarily reserved for the specific use by specific parties or users and through which other traffic may be allowed to transit, under ATC clearance.
Temporary Segregated Area	A defined volume of airspace under the jurisdiction of a user authorised by the ASM Provider, which is temporarily segregated for the exclusive use by specific parties or users and through which other traffic will not be allowed to transit.
Updated Airspace Use Plan	An ASM message issued by an ASM provider on the day of operation, with the objective to update AUP information.
Users	Civil or military aircraft operating in the air as well as any other parties requiring airspace.

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1.2.2 Abbreviations

1.2.2.1 Unless otherwise stated, abbreviations in this MOS have the meanings given in the AIP or as follows:

Abbreviations	Full Name
AA	Approved Agency
AC	Advisory circular
ACC	Area control centre
AIP	Aeronautical information publication
AMA	Manageable area
AO	Aircraft operator
ASM	Airspace Management
ASM level 1	Airspace management level 1
ASM level 2	Airspace management level 2
ASM level 3	Airspace management level 3
ASM provider	Airspace management provider
ATFM	Air traffic flow management
ATS	Air traffic services
ATSP	Air traffic services provider
AUP	Airspace use plan
CAAT	Civil Aviation Authority of Thailand
CBA	Cross-border area
CDR	Conditional Route
CRAM	Conditional route availability message
FIR	Flight information region
FMP	Flow management positions
FUA	Flexible use of airspace
TAA	Temporary airspace allocation
TRA	Temporary reserved area
TSA	Temporary segregated area
UUP	Updated airspace use plan

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Chapter 2 Operations Manual

2.1 General

- 2.1.1 An ASM provider shall provide maintain, amend and keep up to date its operations manuals relating to the provision of its services that complies with the standards set out in this manual for the use and guidance of operations personnel.
- 2.1.2 The ASM provider shall ensure that:
- a) operations manual contains the instructions and information required by the operations personnel to perform their duties;
 - b) relevant parts of the operations manual are accessible to the personnel concerned;
 - c) the operations personnel are informed of amendments to the operations manual applying to their duties in a manner that enables their application as of their entry into force.

2.2 Contents of the operations manual

2.2.1 An operations manual shall contain at least the following information

- a) a table of contents based on the items in the manual, indicating the page number on which each item begins;
- b) a statement showing name, location, and contact number of ASM provider;
- c) a description of the provider's organisational structure and a statement setting out the functions that the provider performs, or proposes to perform;
- d) a description of the chain of command established, or proposed to be established, by the provider and a statement of the duties and responsibilities of any supervisory positions within the organizational structure;
- e) a statement of the functions, responsibilities of each operating position;
- f) a statement showing how the provider determines the number of operational staff required including the number of operational supervisory staff;
- g) a statement showing the hours of operation;
- h) a description of the provider's training and checking program and provide assurance that any individual performing any functions in airspace management services is competent to perform that function
- i) a description of the processes and documentation used to provide operational instructions to staff
- j) a description of the provider's document control and record keeping system;
- k) a description of the arrangements made or proposed to be made by the ASM provider to ensure that it has, and will continue to receive, on a daily basis, the information necessary for providing the service. This requirement includes information that is both internally and externally sourced;
- l) a description of the arrangements made or proposed to be made by the provider to ensure that it has, and will continue to be able to provide, information in connection with its airspace management to others parties whose functions reasonably require that information;

- m) a description of the procedures to be followed to ensure all operational staff are familiar with any operational changes that have been issued since they last performed operational duties;
- n) a description of the processes and documentation used to present to staff the relevant standards, rules and procedures contained in ICAO Civil/Military Cooperation in Air Traffic Management and any of the ASM provider's specific instructions for the provision of airspace management;
- o) a description of facilities & equipment requirements;
- p) a copy of the ASM provider's contingency plan;
- q) a copy of the document that sets out the ASM provider's management system;
- r) a copy of the ASM provider's security program;
- s) a copy of any agreement entered into by the ASM provider in relation to the provision of airspace management;
- t) the procedures to be followed for revising the operations manual.

2.2.2 The operations manual is an important document and shall be issued under the authority of the ASM provider. The ASM provider shall control the distribution of the operations manual and ensure that it is amended whenever necessary to maintain the accuracy of the information in the operations manual and to keep its contents up to date.

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Chapter 3 General Provisions for Airspace Management

3.1 General

This Chapter sets out the general provisions for Airspace management.

3.2 Flexible use of Airspace

The concept of ‘flexible use of airspace’ shall be governed by the following principles:

- 3.2.1 Coordination between civil and military authorities shall be organised at the strategic, pre-tactical and tactical levels of airspace management through the establishment of agreements and procedures in order to increase safety and airspace capacity, and to improve the efficiency and flexibility of aircraft operations.
- 3.2.2 Consistency between airspace management, air traffic flow management and air traffic services shall be established and maintained at the three levels of airspace management enumerated in 3.2.1 in order to ensure, for the benefit of all users, efficiency in airspace planning, allocation and use.
- 3.2.3 The airspace reservation for exclusive or specific use of categories of users shall be of a temporary nature, applied only during limited periods of time based on actual use and released as soon as the activity having caused its establishment ceases.

3.3 The three airspace management (ASM) levels

- 3.3.1 The FUA Concept is based on three Levels of ASM which have been identified as:
 - a) ASM Level 1 (Strategic Airspace Management)
 - b) ASM Level 2 (Pre-tactical Airspace Management)
 - c) ASM Level 3 (Tactical Airspace Management)

The three ASM levels correspond with civil/military ATM coordination tasks. Each level is related directly to, and impacts on, the others. The following paragraphs describe the FUA concept of operation at the three ASM levels.

3.3.2 ASM Level 1 (Strategic Airspace Management)

ASM Level 1 is governed by the National Airspace Policy planning body. An ASM provider shall ensure to supply information - including airspace design, route structure, etc. to the National Airspace Policy planning body to ensure the most efficient airspace design taking into account airspace users requirements including both civil and military.

3.3.3 ASM Level 2 (Pre-tactical Airspace Management)

3.3.3.1 ASM Level 2 with the objective of day-to-day airspace management shall be carried out by the ASM provider.

3.3.3.2 ASM provider are joint civil/military ASM focal-points which have the authority to conduct operational ASM within the framework of the State's airspace structures, priority rules and negotiation procedures as laid down by the ASM Level 1. The ASM provider will collect and analyze airspace requests. After coordination the Airspace Management entity promulgates the airspace allocation as an Airspace Use Plan (AUP) and amendments thereto in Updated Airspace Use Plan (UUP).

3.3.3.3 Consolidated AUP/UUP are daily published by ASM provider and provided to Aircraft Operators (AOs) for flight planning purposes.

3.3.4 ASM Level 3 (Tactical Airspace Management)

3.3.4.1 ASM Level 3 consists of the real time activation, deactivation or real time reallocation of the airspace allocated at ASM Level 2 and the resolution of specific airspace problems and/or traffic situations between Civil and Military ATS Units and/or controlling military units and/or controllers, as appropriate.

3.3.4.2 Real-time information exchange and close coordination between ATS units and ASM provider will enable a more optimized use of airspace and reduce the needs for airspace segregation.

3.3.4.3 General Air Traffic (GAT) and Operational Air Traffic (OAT) have different demands for use of airspace (e.g. separation criteria etc.) The rules governing the management of airspace utilization are different for GAT and OAT. In general, the GAT is subject to Air Traffic Flow Management (ATFM) measures, whereas the airspace movement of OAT are not subject to any ATFM measures. (ICAO Circular 330).

3.3.5 Flexible airspace structures and procedures

3.3.5.1 The FUA concept uses airspace structures and procedure that are particularly suited for temporary allocation and/or utilization such as Conditional Routes (CDRs), Temporary Reserved Areas (TRAs), Temporary Segregated Areas (TSAs), Reduced Coordination Airspace (RCA) and Prior Coordination Airspace (PCA). The use of these airspace structures is enabled through specific processes and procedures described hereafter.

3.3.5.2 Conditional route

a) A conditional route is a non-permanent ATS route or portion thereof which can be planned and used under specified conditions. CDRs permit the definition of more direct and alternative routes by complementing and linking to existing ATS route network. CDRs are divided into different categories according to their estimated availability and flight planning possibilities. CDR can be established at ASM level 1 in one or more of the three following categories:

1) Category 1 (CDR1): permanently plannable

- 1.1) CDRs1 are available for flight planning during times published in the AIP-Thailand.
- 1.2) When a CDR is expected to be available for most of the time, it should be declared as permanently plannable for stated time periods and published as a CDR1 in AIP-Thailand.
- 1.3) CDRs1 can either be established on an H 24 basis or for fixed time periods or at fixed flight level bands.
- 1.4) The closure of CDR1, which requires re-filing of the affected flight plans, has to be published with appropriate advance notification. Any exceptional specific closure of CDR1 which does not require flight planning action by AOs can be treated tactically when appropriate.

2) Category 2 (CDR2): non-permanently plannable

- 2.1) CDRs2 may be available for flight planning. Flights may only be planned on a CDR2 in accordance with conditions published daily in the AUP/UUP.

- 2.2) CDRs2 form part of predefined routing scenarios depending on the allocation of associated Manageable Areas or for addressing specific ATC conditions.
 - 2.3) CDRs2 availability can be requested to adjust traffic flow, when a capacity shortfall has been identified and after consideration of relevant ATC factors by relevant ATSP concerned.
 - 2.4) CDR2 when not available according to AUP/UUP publication may also be managed tactically, whenever conditions allow short notice usage, subject to preventive coordination between responsible ATS and/or controlling military units.
- 3) Category 3 (CDR3): not plannable
- 3.1) CDRs3 are not available for flight planning. Flights must not be planned on these routes but ATC units may issue tactical clearances on such route segments, when made available.
 - 3.2) CDRs3 are those CDRs that are expected to be available at short notice when the pre-notified activity in the associated Manageable Areas has ceased, or for addressing specific ATC conditions.
 - 3.3) After coordination with the ATS or controlling military unit(s) in charge of the associated Manageable Area(s), the responsible controller may offer an aircraft a short-notice routing through the area using a predefined CDR3.
 - 3.4) CDRs3 are published in AIPs as CDRs usable on ATC instructions only and are not subject to allocation the day before by ASM provider.
- b) An established CDR may be closed due to national security reasons or matters involving military contingency. The closure may be temporary or permanent and will be periodically reviewed by the appropriate organisation of ASM Level 1.
 - c) CDRs can be established at ASM Level 1 through areas of potential temporary reservation with opening/closure conditions resulting from associated military activities and/or to address specific ATC conditions with opening/closure conditions resulting from purely civil needs.
 - d) The properties of CDRs including their categories, alignment and route designator are published in the Aeronautical Information Publication (AIP).

3.3.5.3 Temporary Airspace Restriction and Reservation

- a) The Temporary Airspace Allocation (TAA) process consists in the allocation process of airspace of defined dimensions assigned for the temporary reservation/segregation (TRA/TSA) or danger/restricted area (D/R) and identified more generally as a "manageable" area.
- b) Two different types of airspace reservation can be established taking into consideration the activity that would take place associated with the transit possibility:
 - 1) Temporary Reserved Area (TRA): An airspace temporarily reserved and allocated for the specific use of a particular user for a determined period of time and through which other traffic may be allowed to transit under ATC clearance.
 - 2) Temporary Segregated Area (TSA): An airspace temporarily segregated and allocated for the exclusive use of a particular user during a determined period of time and through which other traffic will not be allowed to transit.

Noted: All TRAs and TSAs are airspace reservations subject to management and allocation at ASM Level 2.

- c) TRAs/ TSAs are established at ASM Level 1, allocated (by ASM provider) at ASM Level 2 in response to daily requests for specific periods, and activated at ASM Level 3 for periods corresponding as closely as possible to the real time civil or military airspace users' requirement. In order to conduct several activities in the area, the TRA and TSA may be subdivided at ASM Level 1 and published as such in the AIP-Thailand.

The activation/de-activation process of the subdivided areas allows for the accommodation of daily changes in traffic situations and airspace users' requirements.

- d) TRAs/TSAs are established in response to the need for civil, military, R and D, training, test flights or activities of a temporary nature. TRAs/TSAs are established in accordance with national policy and allocated by ASM provider for specific activities. If, due to the nature of these activities, segregation is needed to protect participating and non-participating traffic, only TSA applies. In these cases, any tactical crossing of the areas when activated should not be allowed.
- e) Whenever an area is planned to be used for activities not always requiring a segregation to protect not-participating aircraft, it should be designated as TRA. In this way it would be possible to improve the flexibility in the usage, allowing tactical crossing when the activity inside doesn't require a protection of not-participating traffic.
- f) In addition, TRAs/TSAs, as manageable parts of the airspace structures, supplement, replace or modify, where possible, existing airspace structures such as D or R areas. However, in some situations, for example in airspace over the high seas, or because of difficulty in the notification of airspace status to airspace users in some ATS classes of airspace, or because of national legal requirements, States may have a continuing requirement to retain D and R areas.

3.3.5.4 Cross-border areas (CBA)

- a) An cross-border area is an airspace reservation/segregation established for specific operational requirements over international boundaries. CBAs are established to allow military training and other operational flights on both sides of a border. CBAs, not being constrained by national boundaries, can be located so as to benefit both civil and military aviation. CBAs, combined with the potential use of conditional routes through them, permit the improvement of the airspace structure in border areas and assist in the improvement of the ATS route network. Political, legal, technical and operational agreements between the States concerned are required prior to the establishment of CBAs. Formal agreements for the establishment and use of CBAs have to address issues of sovereignty, defence, legality, operations, the environment and search and rescue.

3.3.5.5 Prior/Reduced Coordination Airspace Procedures

- a) A Prior Coordination Airspace (PCA) is a portion of airspace of defined dimensions within which individual GAT is permitted to fly "off-route" only after prior coordination initiated by GAT controllers with OAT controllers.
- b) The PCA procedure, as another way of booking airspace, involves a given block of controlled airspace within which military activities can take place on an ad hoc basis with individual GAT transit allowed under rules specified in Letters of Agreement (LoAs) between the units concerned.
- c) A Reduced Coordination Airspace (RCA) is a portion of airspace of defined dimensions within which GAT is permitted to fly "off-route" without requiring coordination between controllers.
- d) When OAT traffic is of low intensity, the need for civil/military coordination of off-route GAT unnecessarily increases controller workload. The RCA procedure is usually applied for a very large area such as the entire FIR, but also for critical ACC sectors which have different capacity figures according to the existence of military activity or not.
- e) Before GAT is permitted "off-route", the OAT controller responsible for the separation between OAT and GAT, must have ready access to all necessary flight and radar data, including controller's intentions, on all relevant GAT within his area of responsibility. Effort may be undertaken to provide specific interoperable ATM infrastructure to achieve this objective.

3.3.6 Particular application of the FUA concept

3.3.6.1 ATS Routes

The term "Permanent ATS Route" is used to designate all ATS routes other than Conditional Routes (CDRs). A Permanent ATS Route is therefore a permanently designated route which is not subject to daily management at ASM Level 2 by ASM provider. Nevertheless, a Permanent ATS Route can be closed, but only under specific conditions specified at ASM Level 1 and published by NOTAM, e.g. for large scale military exercises.

3.3.6.2 Airspace Restrictions - R, D and P Areas

- a) When an airspace restriction is manageable at ASM Level 2, the FUA concept recommends that, where possible, R and D areas are replaced or modified by TRAs or TSAs. However, if there is a continuing requirement to retain R and D areas, and if they are Manageable area, these areas should provide the START and STOP times of their activities to the ASM provider. The AIP identifies as "Manageable Areas" those R and D areas managed and allocated at ASM Level 2.
- b) Any remaining R, D and P areas that are not suitable for ASM Level 2 management remain unaltered from traditional utilization and are identified as such in the AIP.

3.3.6.3 Controlled Airspace

In controlled airspace, CDRs, TRAs/TSAs and/or manageable R or D areas are designated at ASM Level 1 as "pre-determined" airspace structures to be allocated or deactivated at ASM Level 2 by ASM provider on a day-to-day basis and used at ASM Level 3 under conditions known and agreed by both civil and military airspace users and control units involved.

3.4 Priority Rules

- 3.4.1 In order to avoid lengthy negotiation for any of civil/military and military/military requests, it is highly appropriate to establish priority rules, with an aim to promote predictability and stability in airspace planning and allocation.
- 3.4.2 Activities planned well in advance with prior coordination should normally have priority over short-term requests. However, the criticality of short-term request(s) shall be factored in the decision process for according priority.
- 3.4.3 Operational or weather conditions shall be factored in while according priority in airspace allocation. When airspace demand exceeds capacity, and requires quick dispersal to enhance safety, flights impacted by such conditions and operating in such sectors shall be accorded priority. When traffic demand far exceeds the capacity in a given airspace, then such traffic may be permitted to use TRA/TSA airspace after the respective ASM provider effect coordination with appropriate military authorities and obtain their clearance.

Priority rules shall be laid down in SOPs, LOAs governing TSA/TRA allocation and as a general principle, the allocation of TSA/TRA to the agency which is intended to use that airspace shall be given a higher priority.

3.4.4 The order of priority for airspace allocation shall be as follows:

- a) an aircraft which is known or believed to be in emergency compelling it to land without delay e.g. aircraft experiencing engine failure, acute shortage of fuel or total communication failure.
- b) an Aircraft carrying sick or injured persons, requiring urgent medical attention or carrying out approved medical evacuation (Medical Flights).
- c) an aircraft engaged in a live scramble.
- d) an Aircraft proceeding on Search and Rescue missions.
- e) an Aircraft carrying VIP's as laid down in procedures for their handling
- f) military fighter flights invariably experience shortage of fuel if not allowed to proceed as per the planned operations. Any alteration to their optimum flight profile (flight path/level) should be avoided/ minimized in general. The ground time limitations of military fighter aircraft entail that the departures are accommodated from intended Civil/Military aerodromes without any delay.
- g) aircraft landing at alternate aerodromes after diversion due adverse operational or weather conditions at their intended destination.
- h) aircraft on large scale weather deviations.
- i) Flight testing on navigation aids or conducting flight validation

3.5 ASM Relationship with ATS and ATFM

3.5.1 General

- a) As an integral part of Air Traffic Management (ATM), Airspace Management (ASM) should work in close co-operation with both Air Traffic Services (ATS) and Air Traffic Flow Management (ATFM).
- b) An airspace structure reorganised to increase the accessibility of more airspace is accepted as essential to increasing the capacity of the ATS system and reducing GAT delays. Therefore, ACC sector capacity figures will improve in response to the different route and airspace organisation resulting from the daily ASM provider allocation.
- c) In order to achieve an improvement in airspace use, the link between ASM and ATFM is harmonised at all the three Levels including compatibility between ATS, ASM and ATFM procedures and timetables.
- d) During an initial phase, all related pre-tactical ASM and ATFM activities, in particular the promulgation of ASM provider deliverables (AUPs & UUPs) will take place within a common agreed timetable.

3.5.2 ASM/ATFM Relationship at Level 2 (Pre-Tactical Level)

User requirements necessitating segregated airspace form the basis for requests and allocation of TSAs and TRAs (See Paragraph 12.4)

3.5.3 ASM/ATS/ATFM Relationship at Level 3 (Tactical Level)

- a) If a reduction in the activation time of a TSA or TRA is agreed between units, the subsequent release of airspace enables ATS units to open certain CDRs and re-route traffic flows at a short notice. Similarly, military ATS units are able to use TSAs or TRAs at short-notice when they do not affect the general ATFM plan. To enlarge or combine TSAs or TRAs ATS units may be able to allocate, at short notice, some flight levels of an ATS route segment for temporary OAT use.

- b) The use of RCA procedure, by direct agreement between the ATS units involved, reduces the GAT controller's workload by suppressing the need for the individual co-ordination of any off-route GAT under PCA procedure and allows more direct routings and permits radar vectoring around major high density crossing-points.
- c) For example, the identification by the ACC of a TSA or TRA deactivated early and available for use as a CDR is a Level 3 ASM task. The identification of particular CDRs required to resolve the ACC/sector or another ACCs capacity problem is more a Pre-Tactical ATFM task. The consequent re-routing of the GAT flow at short notice is a tactical ATFM task. Finally, the control of the GAT on the newly re-opened CDR is an ATS task of the ACC. The control, co-ordination, safe and expeditious conduct of air traffic, including the resolution of GAT and OAT conflicts, remains within the ATS remit.

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Chapter 4 Human Resource Management

4.1 General

4.1.1 The ASM provider shall ensure sufficient number of competent personnel to perform the operation of the service. The ASM provider shall provide in the operations manual an analysis of the number of personnel required to perform the airspace management taking into account the duties and workload required.

4.2 Requirements

4.2.1 The ASM provider shall document the structure and internal organization with a level of detail according to the size and complexity of the organization.

4.2.2 The ASM provider shall systematically address human resources management in the following key aspects:

- a) Management responsibilities and accountabilities;
- b) Staff deployment;
- c) Operational support arrangements;

4.2.3 The ASM provider shall develop job descriptions for operational staffs and operational supervisory staff. Organization chart indicating the specific responsibilities and accountabilities should be provided.

4.2.4 The ASM provider shall plan the level of staffing requirements taking into account the following factors:

- a) Training requirements;
- b) Rest days or rest periods between shifts;
- c) Leave requirements;
- d) Sick leave reserve;

4.2.5 The ASM provider shall ensure, at all times, enough suitability qualified and trained personnel who are able to supervise the provision of airspace management.

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Chapter 5 Personnel

5.1 General

- 5.1.1 The ASM provider shall ensure that its personnel have appropriate qualification, experience and training to perform their duties in a safe, efficient, continuous and sustainable manner.

5.2 ASM personnel qualification

- 5.2.1 The ASM provider shall establish appropriate minimum qualification and experience requirements for its ASM personnel.
- 5.2.2 The ASM provider shall develop the job description which clearly indicates the specific duties and responsibilities of ASM personnel.

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Chapter 6 Training and Checking Program

6.1 General

6.1.1 The ASM provider shall provide appropriate training and competence assessment for the ASM operational personnel to perform their duties for providing each service in a safe, efficient, continuous and sustainable manner.

6.2 Training program

6.2.1 The ASM provider shall establish the formal training program detailing the type of training to be provided for the ASM operational personnel. The training program shall contain at least the following information,

- a) initial training;
- b) specialize training;
- c) on-the-job (OJT) training;
- d) recurrent and refresher training

6.2.2 The ASM provider shall develop the periodic training plan for each ASM operational personnel.

6.2.3 The ASM provider shall establish a system for the maintenance of training records for each ASM operational personnel.

6.2.4 The ASM provider shall ensure that ASM operational personnel maintain a basic level of competency in recurrent / refresher training that includes knowledge about updates in ICAO provisions and other provisions pertaining to ASM.

6.3 Training Record

6.3.1 The ASM provider shall establish a system for record-keeping of training, qualification and authorization of staff.

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Chapter 7 Facilities and Equipment

7.1 General

- 7.1.1 An ASM provider must have the facilities and equipment that are necessary for providing its ASM, including appropriate premises and equipment to allow operational personnel to perform their duties.
- 7.1.2 The equipment required must have a level of reliability, availability, and redundancy, that minimises the possibility of failure, non-availability, or significant degradation of performance.

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Chapter 8 Management System

8.1 General

8.1.1 Introduction

8.1.1.1 This Chapter sets out the standards for Safety Management and Quality Management System.

8.2 Safety Management

8.2.1 ASM provider shall ensure that a safety assessment, including hazard identification, risk assessment and mitigation, is conducted, before any significant changes to ASM systems and procedures are introduced including an assessment of a safety management process addressing the complete lifecycle of the airspace management system.

8.3 Quality Management

8.3.1 The ASM provider shall implement the quality management according to the following principles.

8.3.2 The quality management shall:

- a) define the quality policy in such a way as to meet the needs of different users as closely as possible.
- b.) set up a quality assurance programme that contains procedures designed to verify that all operations are being conducted in accordance with applicable requirements, standards and procedures.
- c.) provide evidence of the functioning of the quality management by means of manuals and monitoring documents.
- d.) appoint management representatives to monitor compliance with, and adequacy of, procedures to ensure safe and efficient operational practices.
- e.) perform reviews of the quality management in place and take remedial actions, as appropriate

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Chapter 9 Contingency Plan

9.1 General

9.1.1 The ASM provider shall develop and put into effect the contingency plan that defines the planned actions to be taken in the event that services are interrupted.

9.2 Contingency plan

9.2.1 The contingency plan must include:

- a) the actions to be taken by personnel responsible for providing the service;
- b) possible alternative arrangements for providing the service; and
- c) arrangements for resuming normal provision of the service

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Chapter 10 Security program

10.1 General

This Chapter sets out the standards for the security program.

10.2 Security program

The ASM provider shall develop the security program covering the following information:

- a) the procedures for preventing and responding to intentional or unintentional damage to any personnel, facility, equipment, data and software used by the ASM provider in providing the service; and
- b) the procedures for preventing unauthorized people from having access to any facility, equipment, data and software used by the ASM provider in providing the service.

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Chapter 11 Document and Record

11.1 Document and Record Control System

- 11.1.1 The ASM provider shall establish, and put into effect, a system for controlling documents and records relating to the airspace management, including the policies and procedures for elaborating, amending preserving and disposing those documents and records, covering in particular all the elements of the Management System. The system should be organised in a way that ensures document traceability
- 11.1.2 A document control system covers the authorisation, standardisation, publication, distribution and amendment of all documentation issued by the ASM provider, or required by ASM provider for the provision of airspace management.
- 11.1.3 The ASM provider shall maintain the following reference materials:
- a) the Manual of Standards – Airspace Management;
 - b) the ASM provider’s operations manual;
 - c) a copy of ICAO Cir 330 and other relevant ICAO documents;
 - d) a copy of the parts of the AIP that are relevant to the ASM services; and
- 11.1.4 The ASM provider shall keep the reference materials up to date and in a readily accessible form.
- 11.1.5 The provider’s personnel who perform functions in connection to airspace management shall have ready access to the reference materials.
- 11.1.6 The ASM provider shall, at CAAT’s request, elaborate documents, records, copies of them or extracts from them, available for inspection by CAAT.

11.2 Records

- 11.2.1 A system for records covers identification, collection, indexing, storage, security, maintenance, access and disposal of records necessary for the provision of airspace management.
- 11.2.2 The records should be organised in a way that ensures traceability and retrieval throughout the retention period.
- 11.2.3 The record shall contain all relevant data related to the airspace management activities including ASM Level 2 and ASM Level 3.

11.3 Retention period

- 11.3.1 The ASM provider shall retain all the records for at least two years.

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Chapter 12 Airspace Management Level 2 – ASM Level 2

12.1 General

This Chapter sets out the standards for operating procedures for ASM Level 2 (Pre-Tactical Level).

12.2 ASM Level 2

- 12.2.1 Pre-Tactical ASM at ASM Level 2 consists of the day-to-day management and temporary allocation of airspace through the ASM provider.
- 12.2.2 The ASM provider, established with adequate representation from the civil and the military, shall conduct the ASM Level 2 function.
- 12.2.3 The ASM provider shall conduct the ASM function within the framework of airspace structures, priority rules and negotiation procedures as approved by the ASM Level 1.
- 12.2.4 The ASM provider shall strictly adhere to the policies formulated by the ASM Level 1, and engage in collaborative decision making, within the framework of FUA and within the powers vested in it.
- 12.2.5 The ASM provider may, in accordance with an international agreement, manage a cross-border area and/or manage a portion of the airspace of another state (or states).
- 12.2.6 The ASM provider shall accept and assess the application for AA status from airspace users/operators who wish to obtain the AA status.
- 12.2.7 The ASM provider shall perform ASM Level 3 co-ordination tasks.

12.3 Organizational structure of the ASM provider

12.3.1 The ASM provider should comprise of representatives from civil air traffic service providers, representatives from the military and representatives from the other relevant entities.

12.4 Airspace Requests

12.4.1 Units that represent airspace user entities (e.g. squadrons), which wish to utilize TRAs/TSAs, or R and D areas that are suitable for management/allocation by the ASM provider, are identified as AAs. AAs are permitted to negotiate for airspace to be allocated by the ASM provider. When AAs are submitting airspace requests to the ASM provider, the safety should be paramount. The AAs for which the TSA or TRA has been created are considered as a priority user for that airspace once allotted.

The priority rules in paragraph 3.4 shall be considered during the airspace request process.

12.4.2 AAs are required to:

- a) Plan submission of airspace use activities in advance so as to be able to notify their needs for airspace to the ASM provider on the day before of the activity.
- b) Submit to the ASM provider, on the day before the proposed activity (D-1), requests for airspace utilization and allocation.
- c) Ensure on the day of the activity, that the airspace usage is in accordance with the ASM provider's airspace allocation.
- d) Cancel any airspace allocation which is no longer required, Information is forwarded to the ASM provider for the promulgation of an UUP, and to the relevant ATS unit.
- e) Change previously promulgated airspace allocation by coordinating with the ASM provider the promulgation of an UUP.
- f) Submit a new request for airspace allocation to the ASM provider for the promulgation of an UUP.

12.4.3 The requests for airspace use could be presented as a block of airspace required during a specified period of time with the possibility of moving the request in terms of time and flight levels.

12.5 CDR Request

12.5.1 Advance CDR requests can be made to the ASM provider following considerations of mission needs, air traffic demand, and airspace capacity with collaboration between relevant stakeholders.

12.5.2 ASM provider should coordinate with relevant units to determine the needs for the CDRs, and consider deactivating the routes if they are no longer necessary.

12.6 General provisions for allocation and notification process

12.6.1 AAs responsible for airspace activities shall submit their requests for the allocation of airspace or routes – TSAs or CDRs - to the ASM provider, in adherence to the agreed conditions laid down in the formal interfaces for the TSA/TRA activation and deactivation.

12.6.2 After the ASM provider has received, evaluated and de-conflicted the airspace requests, it will convey the allocation plan through a notification of the airspace allocation published in AUP in advance.

12.6.3 If necessary, changes to pre-tactical airspace allocation is effected by the ASM provider through the publication of UUP. This plan notifies the changes to the airspace allocation on the actual day of operations. The AUP and the UUP will be published in Appendix A and B.

12.7 Airspace Allocation

12.7.1 General provisions

- a) ASM provider conducts ASM Level 2 airspace allocation and management operations in a decisive, timely and efficient manner and resolve conflicting airspace requests and Level 2 problems.
- b) After the ASM provider has completed the allocation process, modification of the airspace allocation might be necessary in order to take advantage of any potential to optimize airspace use, increase capacity and reduce delays.

12.7.2 Specific provisions

- a) The ASM provider shall collect and analyze all airspace requests which may require temporary airspace segregation, including airspace allocation decisions taken at ASM Level 1 in respect of major military exercise, airshow etc.
- b) The ASM provider shall analyse the CDR availability requests together with the air traffic demand, anticipated ATC capacity problems and information on expected delays received from the ATS units.
- c) The ASM provider shall resolve conflicting requests for the allocation of TSAs/TRAs and CDRs, utilizing all relevant information, and in general according to the priority rules in Paragraph 3.4.
- d) The ASM provider shall resolve conflicts between incompatible or conflicting airspace requests by the application of approved priority rules, re-negotiation, rescheduling or reservation of airspace.
- e) The ASM provider shall co-ordinate with neighbouring states the availability of cross-border CDRs.
- f) The ASM provider shall respond to the request for assistance by the responsible relevant ATSP or matters arising from the inconsistencies of ATS routes or unforeseen problems while conducting air traffic operation.
- g) The ASM provider shall allocate national TSAs/TRAs and CBAs, upon completion of the procedure for requests comparison, co-ordination, analysis, negotiation and resolution process.
- h) The ASM provider shall activate CDRs2 in accordance with established procedures for a minimum period of one hours, and without limit regarding the extension of the availability of the same route with CDR 1 status.
- i) The ASM provider shall decide on the provisional closure of CDRs 1 with the notification of activity in associated TSA(s)/TRA(s) and/or D or R area(s).
- j) The ASM provider shall promulgate airspace allocation by transmitting the AUP to all relevant entities, in accordance with the standards in Paragraph 14.2.1 of this MOS. Each change of the AUP shall be communicated in accordance with the aforementioned standards.

- k) After the ASM provider has completed the allocation process through the promulgation of the AUP, modification of the airspace allocation might be necessary. Modifications of the airspace allocation are effected by the ASM provider through an UUP and consist of any cancellations, changes or new requests.
- l) The ASM provider shall collect and analyse additional up-to-date information, on the day of operation, from AAs, concerning the cancellation of TSA/TRA already published in the current AUP.
- m) The ASM provider shall promulgate on the day of operation, if necessary, UUP containing deletion of airspace restrictions during the period of validity of the current AUP, and communicate the aforementioned UUPs to the ATFM provider.
- n) The ASM provider shall participate in an analysis of the airspace allocation as required by CAAT.

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Chapter 13 Airspace Management Level 3 – ASM Level 3

13.1 General

- 13.1.1 ASM Level 3 consists of the real-time activation, deactivation or real time reallocation of the airspace allocated at ASM Level 2 and the resolution of specific airspace problems and/or traffic situations between civil and military ATS units, controllers and/or controlling military units as appropriate. Insofar as possible, considerations should be given to optimized use of airspace with reduced needs for segregation.
- 13.1.2 Adequate real time coordination facilities and procedures are required to fully exploit the FUA Concept at ASM Levels 1 and 2. Flexibility in the use of airspace is enhanced by real-time civil/military coordination capability.

13.2 Support Functions

- 13.2.1 At the ASM level 3 the main requirement is to provide support to create a traffic environment in which the FUA Concept can be applied efficiently, i.e. an environment in which the need to segregate traffic is reduced to a strict minimum. This can be achieved by:
- the provision of airspace use information
 - the exchange of flight data, as appropriate, between civil and military units
 - the provision of procedure to facilitate airspace crossing
- 13.2.2 Airspace Use Data Function
- The Airspace Use Data Information Function should provide in real time, all the parties concerned with up-to-date information on the current use of airspace, in addition to AUP/UUPs information on allocated and scheduled use of airspace, so as to make efficient use of all available airspace.
 - The supporting systems should assure common, secure and consolidated information exchange of the current airspace status.

- c) At ASM level 3 airspace management, information should be available to Controllers on activation, deactivation, short-term cancellation or amendments to reservations and reallocation of the airspace structures.
- d) The supporting systems should provide the real time airspace status on an airspace status display and should be capable of interfacing with the ATC systems.
- e) Initially, real time information on the current use of airspace should be provided manually in each ATS unit on their own and for their individual system.

13.3 Processing of airspace reservations

13.3.1 The ASM provider maintains an updated ASM plan at the tactical level. Airspace users shall notify the ASM provider of all known changes to the planned activities. Any activated airspace reservations shall be released for subsequent use by the ASM provider immediately upon the termination of the activity for which the reservation was requested.

13.3.1.1 Activation of reserved airspace

- a) A request for activation shall be submitted to the ASM provider no later than 15 minutes prior to the commencement of the activity for which the reservation was requested. The ATSP must aim to ensure that the airspace can be released for use by the reserving operator no later than the planned activation time.
- b) Activation of an airspace reservation requires that the ASM provider has all data pertinent to the reservation, including contact information of the person in charge of the reservation.
- c) Airspace reservations are activated by the ASM provider, which verifies the information provided by the reserving operator and coordinates the activation with affected ATSP. The ASM provider notifies the reserving operator of the activation.
- d) If an ATSP is unable to accept the reservation in its requested form due to traffic (or if a request was not submitted in accordance with the principles of advance notification applicable to the ASM level 2), the ASM provider must coordinate any restrictions to the airspace reservation with the reserving operator.

13.3.1.2 Changing a reservation

- a) The ASM provider strives to approve airspace reservations in their planned form while taking into account the priority principles for airspace use and jointly agreed cooperation procedures.
- b) Where the reserved airspace has no priority over other affected airspace structures or users, the ASM provider may impose restrictions to an approved reservation either on its own initiative or by request of the service provider when deemed necessary due to traffic. Changes to active airspace reservations will become effective immediately upon the completion of coordination measures. The ASM provider is required to coordinate any changes with all operators affected by the reservation.
- c) If there is a need to ensure the safety of traffic inside the reserved airspace, which is not involved in the ongoing activity, the appropriate ATSP may, in some cases, contact the reserving operator directly and impose restrictions on the ongoing activity. The ATSP must notify the ASM provider of such restrictions immediately for the coordination of changes.

13.3.1.3 Cancellation of airspace reservation

- a) The airspace user must contact the ASM provider to cancel an active reservation upon the termination of the activity for which the reservation was requested. The reservation is considered cancelled upon the receipt of the user's notification. The ASM provider will inform affected operators of the resulting change in airspace status.

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Chapter 14 Promulgation of ASM Information

14.1 Publication of ASM information

14.1.1 ASM Level 1 publication

- a) The airspace structures and ATS routes shall be published in AIP-Thailand.
- b) The major events planned well in advance shall, such as largescale military exercises or air shows, which may require additional segregated airspace be published by AIS publication.

14.1.2 Publication of CDR routes, their availability and conditions

- a) In order to harmonize AIP publication describing times and conditions, as to when a CDR is available for flight planning the following procedure is being followed in AIP - Thailand.
- b) In case of timely repetition during the equal periods, information in the remarks column of the AIP ENR 3 should clearly describe the following situations for the route:
 - 1) If the CDR is available for a H24 period, column 6 of the description of ATS routes contains an insertion: CDR1 H24;
 - 2) If CDR1 conditions applies for a certain period of time, column 6 contains an insertion to that effect e.g. CDR1 23.00h -05.00h, together with what happens outside this time period, i.e. not available and/or all other possible combinations.
 - 3) If weekly periods apply then column 6 contains an insertion e.g. CDR1 MON-FRI 23.00h-05.00h and/or FRI 14.00h - MON 06.00h; CDR2 rest of the week and/or all other possible combinations.
 - 4) In case where only a portion of a route is published as being a CDR, and being a permanent route outside a time period, flight level or geographical boundaries, AIP publication should cover:
 - 4.1) The applicable CDR time period apply above procedures;

- 4.2) Different category (e.g. CDR 1 FL280 - FL460 MON - FRI 08.00h - 10.00h, applicability of permanent use outside this period and FLs and/or all other possible combinations).

14.2 Specific ASM messages for ASM Level 2 Decisions

14.2.1 Airspace Use Plan (AUP)

- a) An Airspace Use Plan (AUP) is the official medium for the daily notification by an ASM provider of the national airspace allocation for the following day.
- b) An ASM provider shall release only one AUP per day.
- c) The AUP shall be transmitted to the ASM provider dedicated interface for ASM. The AUP shall be distributed with the information prescribed in Appendix A at a specified time on the day before operations (D-1). The ASM provider shall specify the time of day for the AUP publication that satisfies the stakeholders' needs.
- d) The infrastructure/procedures for dissemination of AUP to the military units should be provided on mutually agreed terms.
- e) Changes to the airspace allocation could be effected on the day of operations by the ASM provider through an UUP.

14.2.2 Updated Airspace Use Plan (UUP)

- a) After the ASM provider has completed the allocation process and published accordingly the AUP (See Appendix B), modification of the airspace allocation might be necessary in order to take advantage of the cancellation of any previously reserved airspace structure. This may also have to be resorted to in case of sudden unexpected requirements of military to close certain routes/portions of routes, additional activation of TRAs/TSAs and/or increased timings for already activated TRAs/TSAs is to be effected. Changes to the airspace allocation will be effected by the ASM provider through UUPs.
- b) UUP will replace the current AUP and previous UUPs according to the validity time described in the procedure. It reflects the new plan with the aim of improving ATS capacity and reducing GAT delays through the more efficient use of airspace and also for accommodating tactical military requirements. In particular, UUPs will contain details of:
 - 1) the cancellation of TSAs/TRAs allocated in the current AUP;
 - 2) new Category Two CDRs or RCAs made available as a result of TSA/TRA cancellation;
 - 3) modifications made to Category Two CDRs or RCAs already listed in the current AUP;
 - 4) alterations to, or cancellations of, Closed ATS Routes or Category One CDRs, Manageable R and D Areas and Reduced Airspace Restrictions listed in the current AUP.

14.2.3 ASM Level 2 Timetable

14.2.3.1 Up to 48 hours in advance

The ASM provider and relevant ATSP, in coordination with the ATFM provider, should assess the expected traffic forecast for the particular day, identify and highlight capacity shortfalls, and agree on the traffic flow adjustment requirements that will be requested on the particular day of operations.

14.2.3.2 The Day before Operations (D-1)

On the day before operations, the following actions are applicable:

- a) the relevant ATSP, should compare the ATFM provider operational requirements for traffic flow adjustment with relevant factors such as sector handling capability, equipment constraints, staff availability and operational factors, and determine the corresponding CDRs2 and/or for specific airspace configuration requirements.
- b) the relevant ATSP should send the CDRs2 availability and/or for specific airspace configuration requests to the ASM provider, with details of traffic forecasts, capacity shortfalls and delay predictions
- c) the AAs should collect all airspace user requirements for CDRs, TRAs/TSAs, manageable R and D Areas, for the 24-hour period of the next day of operations, and submit them as the civil/military Airspace Requests to the ASM provider.
- d) the ASM provider should collect, collate and analyze all airspace requests, resolve conflicts through negotiation and coordination, respond to any additional requests to resolve route inconsistencies, and decide on allocation of CDRs and TRAs/TSAs in accordance with priority rules established at ASM Level 1
- e) the ASM provider should obtain details of, or in case of CDRs1 managed at ASM Level 2, decide on, the periods of temporary closure of CDRs1, and should obtain details of the periods of use of RCAs

- f) After composing a draft AUP, the ASM provider should evaluate the impact on the network of the "draft" airspace allocation in close coordination with relevant service providers identify optimal scenarios and forward proposals to relevant service providers. A scenario may contain recommendations on change in CDRs/TRA/TSA's availability details (e.g. flight level band, availability time), sector reconfiguration, etc.
- g) the ASM provider should coordinate proposed changes with the Airspace Users that requested airspace reservations, if required; The final airspace allocation decision remains the responsibility of the ASM provider.

14.2.4 Modification of AUP via UUP publication

14.2.4.1 The following procedures will be applied to provide information to the users about changes of the airspace plan in relation of release of areas previously planned as well as new availability of CDRs.

14.2.4.2 Modification of AUP via UUP publication on D-1

- a) The Airspace Users that have requested airspace allocations should advise the ASM provider about any change in their planning. This will enable the associated CDR to be available for additional period than that planned in the earlier AUP. If required, the ASM provider should inform the relevant ATSP and ATFM provider about the new airspace opportunities using a UUP.
- b) as from the AUP publication, the Airspace Users that requested airspace allocations should advise the ASM provider about changes in their planning for the next day, if any (e.g. activity completed earlier than planned, cancelled or reduced in time or volume, etc.)
- c) when required, and if there is no requirement for use of that volume of airspace from other users, ASM provider should inform relevant ATSP and ATFM provider regarding the intention to lift/decrease airspace segregations (in time and/or space) via the promulgation of the first convenient UUP. So, ASM provider shall specified the starting time and last time to promulgate UUP.
- d) Any UUP promulgate by ASM provider contains full information on airspace allocation.

14.2.4.3 The Day of Operations

- a) As Required on the Day of Operations (D)
 - 1) the Airspace Users that requested airspace advise the ASM provider about any change in their planning (e.g. activity completed earlier than planned, cancelled or reduced in time or volume, etc.) or any additional airspace requirements in terms of time/space. This will enable/disable the associated CDR to be available/unavailable for additional period(s) than that planned in the AUP.
 - 1.1) Upon reception of such information, the ASM provider shall check if airspace is needed by another user(s).
 - 1.2) The ASM provider shall collect and analyse up-to-date information from AAs concerning cancellations or de-activation of airspace already in the AUP/UUP.
 - 1.3) The ASM provider shall inform relevant ATSP and ATFM provider about the new airspace opportunities using the first convenient (no lead time is required) UUP. Each UUP promulgated by ASM provider supersedes the previous one(s).
 - b) In case of draft UUP, ASM provider should consider the time required for coordination and identify which UUP will be suitable to eventually the information.
 - c) The ASM provider shall receive the scenario proposed by ATFM provider and relevant ATSP and take into consideration their proposals.
 - d) The ASM provider decides in accordance with criteria established at Level 1 on the provisional closure of CDRs 1 to be handled in real-time at Level 3.
 - e) The ASM provider shall take their final airspace allocation decision, and, if required, promulgate the information using the most suitable UUP. Lead time for the validity of the change(s) is not required.

14.2.4.4 Restricted Airspaces Management in AUP/UUP

- a) Restricted Airspaces represent a part of the Airspace where General Air Traffic (GAT) can be restricted. In practice, it corresponds in most cases with airspace where military operations or other operations that require segregations.

14.2.4.5 Activation

- a) The Restricted Airspace Activation includes a FL band (Lower/Upper FL), a start date and time, and the end date and time.
- b) Restricted Airspace allocations from Released AUPs/UUPs are automatically propagated to the corresponding RSA Activation tables.

14.2.5 Unplanned activations of TSAs/TRAs

14.2.5.1 As Required on the Day Before Operations:

- a) The Airspace Users that need additional airspace reservations should advise the ASM provider on the unplanned activation of airspace required (in addition to those published by AUP earlier).
- b) If required, the ASM provider may carry out coordination with neighbouring ASM providers and identify potential available areas in order to find other solutions instead of closing a CDR that was previously available.
- c) The ASM provider should inform relevant ATSP concerned and ATFM provider regarding intentions to implement new or increase already published airspace reservations (in time and/or space) via promulgation of Draft UUP.
- d) The ASM provider, ATFM provider, and relevant ATSP should assess the impact of the request at local and network level. During this step, ATFM provider should identify the flights and/ or ATS sectors that would be impacted by the route closure, and consider these elements in the assessment, look for opportunities (reducing the network impact) and coordinate with the ASM provider and relevant ATSP concerned for optimization of airspace allocation.
- e) The result of this analysis and potential alternative scenarios (if any) should be sent by ATFM provider to the ASM provider and to the relevant ATSP for their consideration
- f) The ASM provider should receive the Scenario proposed by ATFM provider and conduct final coordination with Airspace Users, if required.
- g) The ASM provider should take the final airspace allocation decision, and if required, the ASM provider should define the times to compose UUP and release the resulting UUP information at the latest.

- h) The new CDR closure information shall be disseminated by the ASM provider and/or ATFM provider and also be promulgated with appropriate advance AIS notice.

14.2.5.2 As Required on the Day of Operations:

- a) The Airspace Users that need additional airspace reservations should the ASM provider on the unplanned activation of airspace required for the day of operation (D).
- b) The ASM provider shall inform relevant ATSP concerned and ATFM provider regarding the intention to activate new or increase already published airspace reservations (in time and/or space) via promulgation of Draft UUP.
- c) The ASM provider shall assess the impact of the request at local and network level. During this step, the ASM provider in coordination with relevant ATSP concerned should identify the flights and sectors that would be impacted by the route closure, and look for opportunities reducing the network impact.
- d) ATS units concerned should assess their ability to manage tactically the flights to be in the execution phase if any and in coordination with the ASM provider and ATFM provider look for optimization of airspace allocation in such way to ensure the number of flight in execution phase to be handled tactically (number of flights to be in the execution phase) is kept at acceptable level for ATCO (s) concerned;
- e) The ASM provider with agreement of relevant ATSP concerned should take its final airspace allocation decision.

14.2.6 Use of Tactical Management

The ASM provider should decide in accordance with criteria established at ASM Level 1 on the provisional closure of CDRs1 to be handled in real time at ASM Level 3.

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Appendix A Description of the airspace use Plan (AUP)

A1 Preparation, Promulgation & Distribution of the AUP

A1.1 During the pre-AUP coordination procedure, Draft-AUPs will be used and identified as “Draft AUP”. At any time, there will be only ONE stored AUP per day and per ASM provider in "Draft" or "Released" form identified respectively in the first line of the header as "Draft AUP" or "AUP". The "Released" form will be decided by the ASM provider itself at D-1 at the very latest.

A2 Description of the AUP

A 2.1 The AUP shall contain, at minimum, the following information:

A 2.1.1 Header

- a) Identification
- b) Identification of the Sending Unit
- c) Definition of the Validity Period of the Message
- d) Date and Time of Transmission of the AUP

A 2.1.2 The contents of the AUP shall contain the following information, which satisfies the operational needs:

- a) List of CDR2 availability and military area availability
- b) List of closed ATS route and CDR1 route closed
- c) List of TSAs, TRAs and manageable D and R areas
- d) List of changed airspace restrictions
- e) List of reduced coordination airspaces
- f) Additional information / NOTAM Series-J

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Appendix B Description of the Update Airspace Use Plan (UUP)

B1 Preparation, Promulgation & Distribution of the UUP

B1.1 The UUP shall be prepared by the ASM provider in the same common format as the AUP.

B2 Description of the UUP

B2.1 The UUP shall contain, at minimum, the following information:

B 2.1.1 Header

- a) Identification
- b) Identification of the Sending Unit
- c) Definition of the Validity Period of the Message
- d) Date and Time of Transmission of the UUP

B 2.1.2 The contents of the UUP shall contain the following information, which satisfies the operational needs:

- a) Amended list of CDR2 availability and military area availability
- b) Amended list of closed ATS route and CDR1 route closed
- c) Amended list of TSAs, TRAs and manageable D and R areas
- d) Amended list of changed airspace restrictions
- e) Amended list of reduced coordination airspaces
- f) Additional information / NOTAM Series-J

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